

Streamlining Energy Management for a Major Supercenter

Executive Summary

A leading national supercenter chain operating over 1,000 locations decided to deploy distributed energy, energy storage, and EV charging to further their corporate sustainability goals and to mitigate key challenges with energy costs and resiliency. DG Matrix developed a nationally-scalable concept¹ leveraging its Power Router solutions to integrate multiple on-site energy generation and storage sources with building power and EV charging. The resulting project is estimated to achieve **30%** CapEx savings, to reduce utility bills by **26%**, and to deliver an IRR of **31%**, resulting in a payback period of less than **3.5 years**.

Challenges

The customer faced mounting energy-related issues, including:

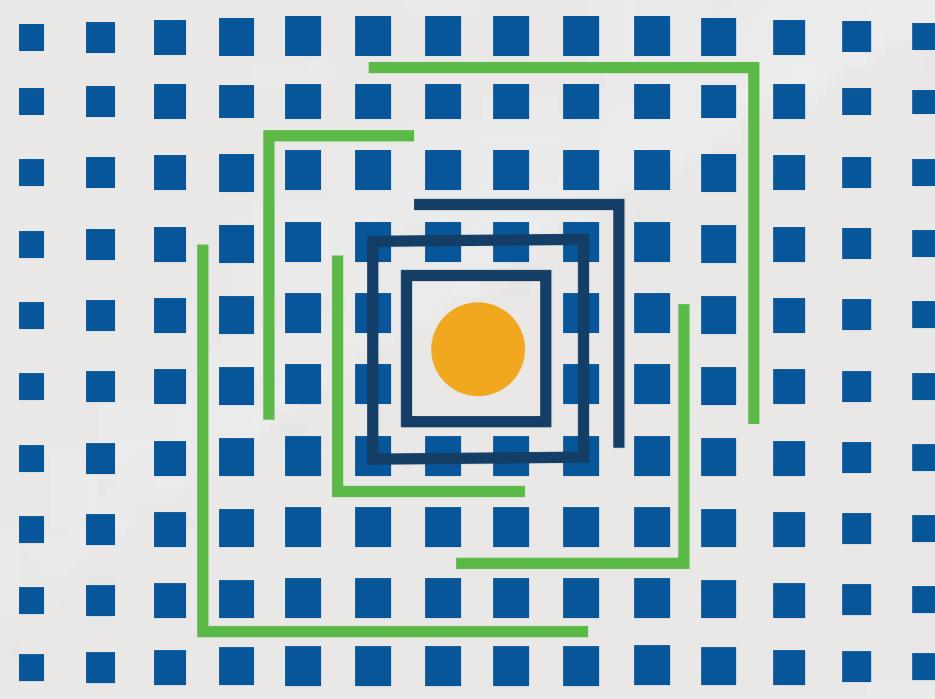
- **High Energy Costs:** Rising utility bills due to increasing energy consumption and peak demand charges. These costs are expected to rise with electrification and EV charging loads.
- **Resiliency Challenges:** Frequent power disruptions threatening perishable inventory and business continuity.
- **Costly Infrastructure Upgrades:** Significant capital expenditure required to integrate on-site energy and to deploy EV charging stations.

Requirements and Priorities

The supercenter chain outlined several critical priorities for addressing these challenges:

- **Cost Optimization:** Reducing both CapEx and OpEx while achieving **>15% savings** on utility bills.
- **Resiliency:** Ensuring uninterrupted 24/7 power
- **Scalability:** Deploying a standardized solution across its national store footprint to significantly reduce complex systems engineering.
- **Sustainability Goals:** Aligning energy strategies with corporate ESG commitments by integrating renewable energy sources.
- **Simplicity and Speed:** Minimizing project complexity, installation timelines, and disruption to store operations.

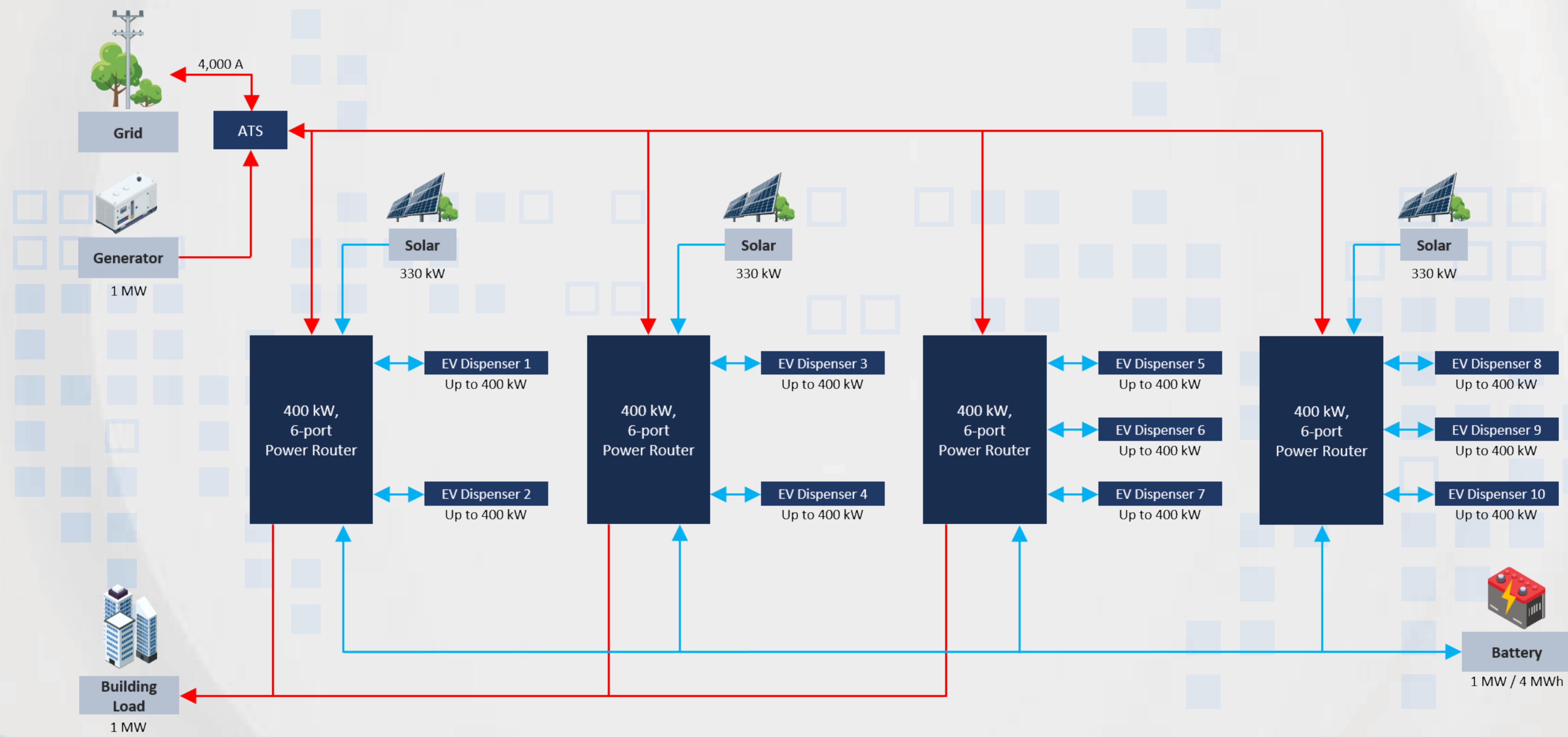
¹ Project has not yet been deployed yet



Proposed Solution: Microgrid Enabled by the DG Matrix Power Router

DG Matrix provided each location with **three 400-kW 6-port Power Routers** designed to meet the supercenter's needs. These Power Routers are at the core of the location-specific microgrid, seamlessly incorporating different energy sources and loads via their ports:

- **EV charging dispensers:** (10 dispensers, up to 400 kW each)
- **Solar PV system:** (~1 MW)
- **Battery storage:** (up to 1 MW / 4 MWh)
- **Backup generator:** (~1 MW)
- **Building power:** (up to 1 MW total load)
- **Grid interconnection:** (4,000 A service from utility)



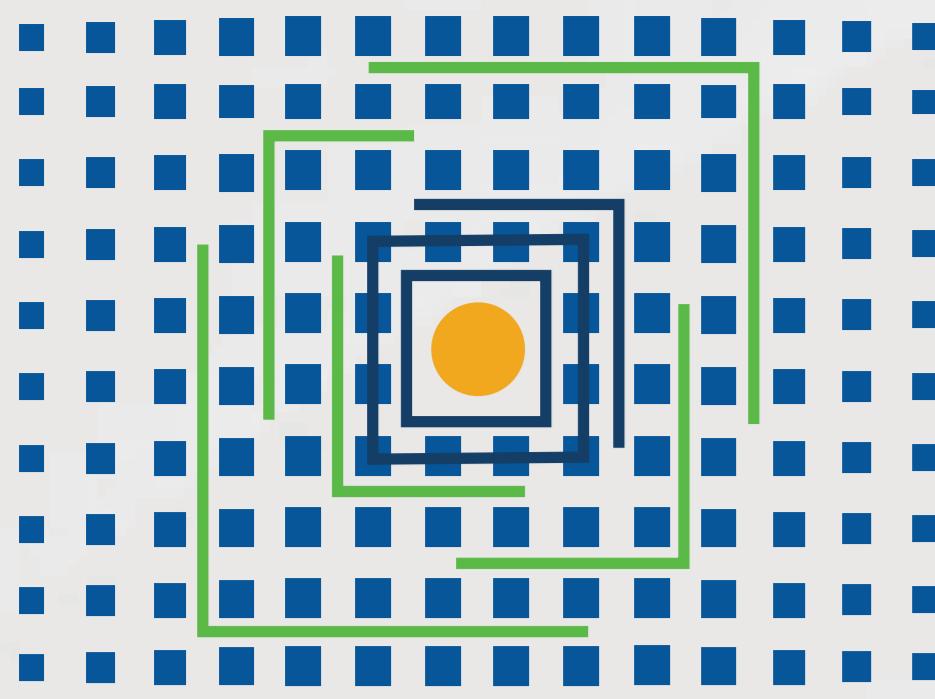
Results

CapEx Reduction:

- **30% savings** compared to traditional solutions by consolidating multiple hardware components into a single unit.
- **38% lower installation costs** due to simplified infrastructure and reduced need for grid upgrades.

OpEx Reduction:

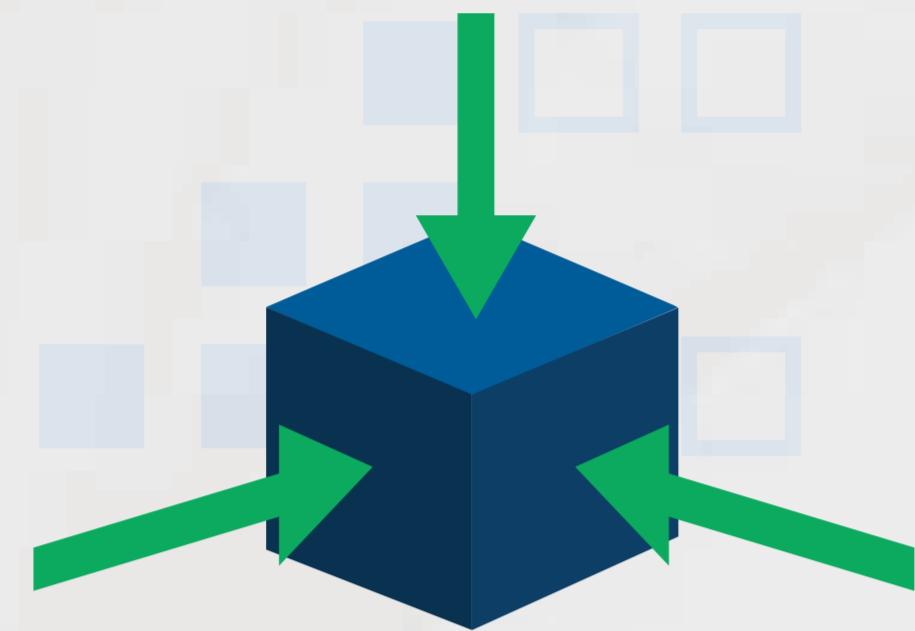
- **26% reduction in annual energy costs** through demand charge mitigation, efficiency gains, and distributed energy usage.
- **4-5% lower maintenance costs** due to fewer components and advanced monitoring capabilities.



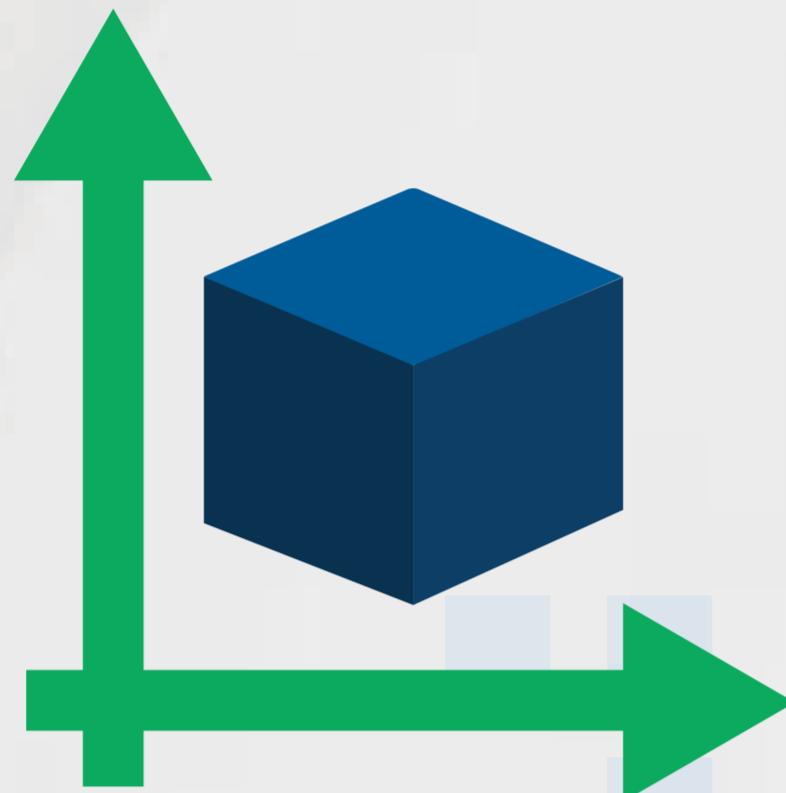
Financial Metrics:

- Payback achieved in **3.5 years**, compared to 6+ years for traditional DER solutions.
- IRR: **31%**

Value-Added Features and Additional Benefits



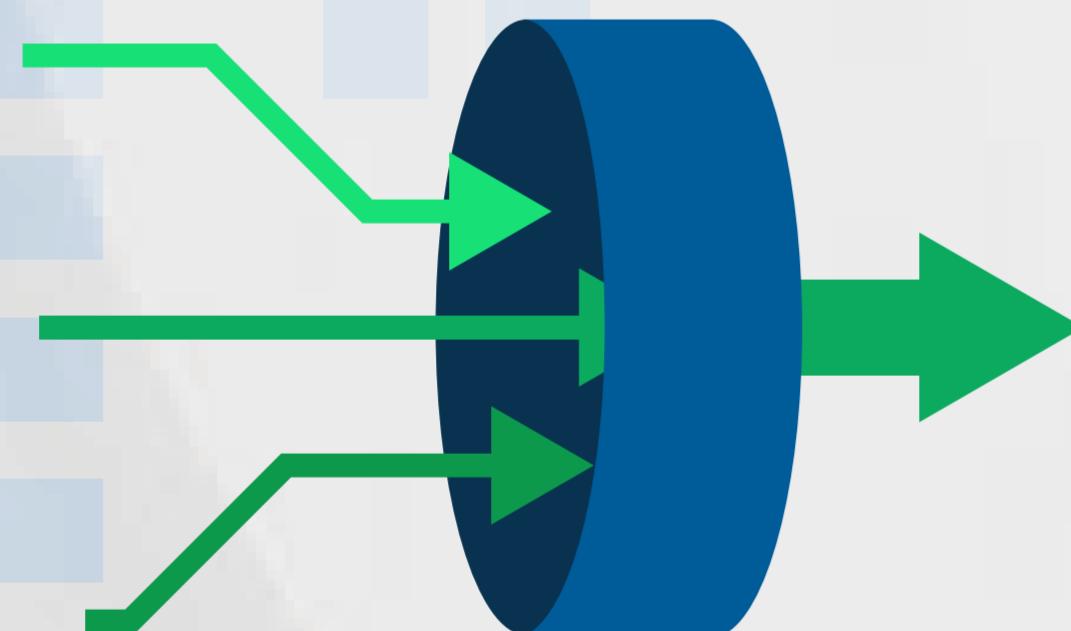
Enhanced Resiliency: Improved reliability during outages with seamless transition to on-site DERs and EV chargers.



Future-Proof Scalability: Ability to support EV charging expansion and integration of additional energy sources without additional major upgrades.



Grid Support Services: Additional revenue opportunities and cost savings by implementing vehicle-to-grid, virtual power plant, and demand response capabilities.



Operational Simplicity: Unified control platform reducing complexity and streamlining energy operations across all sites.

Conclusion

By deploying DG Matrix's integrated energy platform, the supercenter chain will successfully reduce energy costs, enhance resiliency, and position itself to meet future demands, all while aligning with its sustainability goals. With scalable, cost-effective solutions tailored to its operational needs, the company is well-equipped to lead in energy innovation across its portfolio of locations.

To learn more about how DG Matrix Power Router can revolutionize your energy management, reduce costs, and future-proof your business, contact our team of experts today. We're ready to help you achieve your energy goals and stay ahead in the evolving market.

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